United States
Environmental Protection Agency

Air and Radiation
Stratospheric Protection Division
6205J

Substitute Solvents Used in Adhesives, Coatings and Inks Under SNAP as of May 17, 2013

SNAP Information: http://www.epa.gov/ozone/snap

EPA has created the Significant New Alternatives Policy (SNAP) Program under section 612 of the Clean Air Act Amendments. SNAP evaluates alternatives to ozone-depleting substances. Substitutes are reviewed on the basis of ozone depletion potential, global warming potential, toxicity, flammability, and exposure potential as described in the March 18, 1994 final SNAP rule (59 FR 13044). Lists of acceptable and unacceptable substitutes will be updated periodically in the Federal Register. The following SNAP notices and subsequent final rules are included in this list: August 26, 1994 (59 FR 44240), January 13, 1995 (60 FR 3318), June 13, 1995 (60 FR 31092), July 28, 1995 (60 FR 38729), February 8, 1996 (61 FR 4736), May 22, 1996 (61 FR 25585), September 5, 1996 (61 FR 47012), October 16, 1996 (61 FR 54030), March 10, 1997 (62 FR 10700), June 3, 1997 (62 FR 30275) , February 24, 1998 (63 FR 9151), May 22, 1998 (63 FR 28251), January 26, 1999 (64 FR 3861), April 28, 1999 (64 FR 22981), June 8, 1999 (64 FR 30410), December 6, 1999 (64 FR 68039), April 11, 2000 (65 FR 19327), June 19, 2000 (65 FR 37900), December 18, 2000 (65 FR 78977), March 22, 2002 (67 FR 13272), and May 17, 2013 (78 FR 29034).

Substitutes for Solvents Used in Adhesives, Coatings and Inks under the Significant New Alternatives Policy (SNAP) Program as of May 17, 2013

Substitute	ODS Being Replaced	Decision	Conditions or Restrictions	Comments
Petroleum hydrocarbons	Methyl chloroform	Acceptable	None	OSHA standards exist for many of these chemicals. Formulators should use chemicals with lowest toxicity, where possible.
Oxygenated organic solvents (esters, ethers, alcohols, ketones)	Methyl chloroform	Acceptable	None	OSHA standards exist for many of these chemicals. Formulators should use chemicals with lowest toxicity, where possible.
Chlorinated solvents (trichloroethylene, perchloroethylene, methylene chloride)	Methyl chloroform	Acceptable	None	High inherent toxicity. Use only when necessary. OSHA and RCRA standards must be met.
Terpenes	Methyl chloroform	Acceptable	None	None
Water-based formulations	Methyl chloroform	Acceptable	None	None
High-solid formulations	Methyl chloroform	Acceptable	None	None
Monochlorotoluene/ benzotrifluorides	Methyl chloroform, CFC-113, HCFC-141b	Acceptable subject to use conditions	Subject to a 50 ppm workplace standard for monochlorotoluenes based on an OSHA PEL of 50 ppm for orthochlorotoluene.	The acceptable exposure limit (AEL) for benzotrifluorides is 100 ppm.

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Substitute	ODS Being Replaced	Decision	Conditions or Restrictions	Comments
Trans-1,2-dichloroethylene	Methyl chloroform	Acceptable	None	The OSHA set exposure limit is 200 ppm.
Chlorobromomethane	Methyl chloroform, CFC-113	Unacceptable	N/A	Other alternatives exist with zero or much lower ODP.
Alternative technologies (e.g., powder, hot melt, thermoplastic plasma spray, radiation-cured, moisture-cured, chemical-cured, and reactive liquid)	Methyl chloroform	Acceptable	None	None
Hydrofluoroether (HFE) 7100: C4F9OCH3 (methoxy-nonafluorobutane, iso and normal)	Methyl chloroform, CFC-113, HCFC-141b	Acceptable	None	None
HFE-7200	Methyl chloroform, CFC-113, HCFC-141b	Acceptable	None	None
Trans-1-chloro-3,3,3-trifluoroprop-1-ene	All	Acceptable	None	*Trans*-1-chloro-3,3,3-trifluoroprop-1-ene has an ODP of approximately 0.00024 at temperate latitudes. It has a 100-year global warming potential of 4.7 to 7. Its Chemical Abstracts Service Registry number (CAS Reg. No.) is 102687-65-0. The manufacturer recommends an acceptable exposure limit of 300 ppm over an 8-hour time-weighted average for *trans*-1-chloro-3,3,3-trifluoroprop-1-ene. Note that this substitute boils at room temperature, which may require some adjustments when switching to this substitute. At this time, it appears to be particularly suitable for spray adhesive applications and dip coatings. Observe recommendations in the manufacturer's MSDS and guidance for using this substitute.